

Own experience in the treatment of major salivary gland tumors

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A – Study Design
B – Data Collection
C – Statistical Analysis
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F – Literature Search
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ABSTRACT:

Introduction: The paper aims to demonstrate the Clinic's and own research in the treatment of major salivary gland tumors.

Material and method: In the years 2013–2019, there were 95 salivary gland surgeries, including 45 performed in women (47.36%) aged between 24 and 82 and in 50 men (52.64%) aged 29 to 86. Diagnostics of major salivary glands included: patient history, otolaryngological examination, ultrasound and fine needle aspiration (BACC) (of tumor), laboratory tests (morphology, CRP) and computed tomography (CT) or magnetic resonance imaging (MRI) to accurately assess salivary glands, location of lesion and lymph nodes prior to elective surgery.

Research results: In the analyzed material patients with major salivary gland tumors were most frequently operated on at the age of 61–70 (34.7%) and 51–60 years (23.2%). Most patients with tumors were hospitalized in the last 4 years between 2016–2019, which accounted for 77.8% of all operated cases. Among the operated lesions, benign neoplasms and tumors occurred in 93.7%, of which the most frequent findings in histopathological examination were Warthin tumor in 50.5%, and multiform adenoma in 26.3%. The remaining tumors and benign neoplasms constituted only 16.9% and were observed in isolated cases, including eosinophilic adenoma, lymphoepithelial cyst, myoepithelial adenoma, lipofibrosarcoma, congestive cyst, air cyst, tubular adenoma, basal cell carcinoma, cyst with squamous metaplasia features, vascular malformation. Malignant salivary gland tumors were found in 6.3%, including the following malignant tumors were revealed histopathologically: adenocarcinoma, mucoepidermal carcinoma, acinocellular carcinoma, epithelial-myoeepithelial carcinoma, ductal carcinoma.

Conclusions: The majority of operated salivary gland tumors were benign (93.7%), of which the most common histopathologically were: Warthin tumor (50.5%) and multiform adenoma (26.3%), while malignant tumors occurred in 6.3%. Tumors were localized mainly in the parotid gland in as many as 93.7% cases, of which the most common localization concerned the superficial lobe in 56.8%. The most frequent surgical technique used in the Clinic was extracapsular dissection of the tumor in 88.4%, and other methods were used rarely.

KEYWORDS:

clinic, major salivary glands, own experience, treatment, tumors

ABBREVIATIONS

BACC – fine needle aspiration
CRP – C-reactive protein
CT – computed tomography
MRI – magnetic resonance imaging
USG – ultrasound

INTRODUCTION

The proper work of the salivary glands is of key importance for the proper functioning of the digestive and respiratory systems. The main product of salivary glands, i.e. saliva, has a protective effect on the oral mucosa and upper respiratory tract (IgA, lysozyme); through the amylase contained in it, it begins to digest starch already in the mouth, facilitates swallowing food and protects teeth against decay. According to the National Cancer Registry, in recent years head and neck cancers have accounted for 5.5 to 6.2%

of all malignancies, which translates to approximately 5,500 to 6,000 new cases annually.

In 2015, a total of 347 new malignancies of major salivary glands were registered, of which 181 men and 52 women died of salivary gland cancer.

In 2015, the crude incidence rate of malignant neoplasms of major salivary glands in Poland was 0.3/100,000 (for parotid gland 1.0) in men and 0.2/100,000 in women (for parotid gland 0.8). In men there were 58 new cases of malignancies of major salivary glands of other or unspecified origin (and 181 cases of parotid gland cancers), while women were affected in 46 cases (and 166 cases of malignant parotid gland tumors).

In the Łódź Voivodeship, there were 14 malignant cancers of the parotid gland and 5 malignancies of other and unspecified origin affecting major salivary glands in women, while in men 19 cases and 5 cases were found, respectively.

Tab. I. List of patients depending on age range and gender.

AGE RANGE (IN YEARS)	20–30		31–40		41–50		51–60		61–70		ABOVE 70		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Women	2	2.1	7	7.4	2	2.1	12	12.6	14	14.7	8	8.4	45	47.3
Men	2	2.1	4	4.2	7	7.4	10	10.6	19	20.0	8	8.4	50	52.7
Total	4	4.2	11	11.6	9	9.5	22	23.2	33	34.7	16	16.8	95	100.00

An increase in the incidence of malignant parotid gland tumors can be observed in men aged 55–64 years and women 60–79 years, while there is also an increase in the incidence of other or unspecified conditions of major salivary glands in men aged 65–69 years and women 65–74 years [1]. Regarding the incidence of malignant neoplasms in men in 2015, the absolute number is 58 cases of other and unspecified conditions of major salivary glands and 181 parotid gland cancers with the crude ratio at 0.2 and 0.8, and the standardized ratio at 0.2 and 0.6, respectively.

As for the incidence of malignant neoplasms in women in 2015, the absolute number is 46 cases of other and unspecified conditions of major salivary glands and 166 parotid gland cancers with the crude factor at 0.3 and 1.0, and the standardized factor at 0.1 and 0.5, respectively.

Salivary gland tumors form a heterogeneous group of neoplasms due to the complex embryogenesis of salivary glands. They are divided into benign and malignant tumors. The most common benign tumors include adenomas, or multiform adenoma (tumor mixtus), monomorphic adenoma – Warthin tumor (cystic lymphangioma); less frequent cases include: cystic lymphangioma, hemangioma, lymphangioma (cystic hygroma).

Malignant tumors constitute about 25–30% of salivary gland tumors and include: adenocarcinoma, acinar cell carcinoma, adenoid cystic carcinoma, multiform adenoma and malignant lymphomas (MALT type, B cell lymphoma as well as metastasis of other malignant tumors). To assess the grading, we use the AJCC/UICC TNM classification, where T – stands for tumor, N – lymph nodes, M – metastasis [2].

Numerous studies prove that the probability of developing a malignant tumor increases inversely in proportion to the size of the gland, whereby malignant tumors constitute about 65–80% of tumors of the sublingual glands and minor salivary glands.

Symptoms which could suggest a malignant nature of the tumor include: rapid growth (exception – highly differentiated mucoepidermoid carcinoma), hard, motionless, painful tumor, often with ulceration, lymph node metastases, swollen, hard lymph nodes, and facial paralysis or recurrent inflammation in parotid gland tumors.

It is estimated that 80% of salivary gland cancers occur in the parotid gland and 10–15% in the submandibular gland. Moreover, 80% of cancers are benign tumors.

The most common symptoms of benign salivary gland tumors are slow, long-term painless growth, normal facial nerve function and a lack of metastases. The main risk factors for salivary gland cancers are exposure to radiation, dust, and nicotinism (especially associated

Tab. II. List of patients operated on in individual years depending on gender.

YEAR OF SURGERY	WOMEN		MEN		TOTAL	
	N	%	N	%	N	%
2013	3	3.2	3	3.2	6	6.4
2014	-	-	3	3.2	3	3.2
2015	4	4.2	8	8.4	12	12.6
2016	12	12.6	7	7.4	19	20.0
2017	9	9.5	10	10.5	19	20.0
2018	8	8.3	9	9.5	17	17.8
2019	9	9.5	10	10.5	19	20.0
Total	45	47.3	50	52.7	95	100.0

with Warthin tumor). The paper aims to demonstrate the Clinic's and own research in the treatment of major salivary gland tumors.

MATERIAL AND METHODS

In the years 2013–2019, at the Laryngological Oncology, Audiology and Phoniatrics Clinic of the USK WAM in Łódź there were 95 salivary gland surgeries, including 45 in women (47.36%) aged between 24 and 82 and in 50 men (52.64%), aged 29 to 86 (average age 53.5). Diagnostics of major salivary glands included: history, otolaryngological examination, ultrasound (USG) and fine needle aspiration (BACC) (of tumor), laboratory tests (morphology, CRP) and computed tomography (CT) or magnetic resonance imaging (MRI) for accurate assessment of salivary glands, location of lesion and lymph nodes prior to elective surgery [3].

The basic method of treatment was surgical excision of salivary gland tumor under endotracheal anesthesia. In cases of benign, encapsulated tumors (such as Warthin tumor), the tumor itself was excised (so-called enucleation, local tumor resection, extracapsular dissection of tumor) or the tumor was excised with part of the gland (so-called excision margin of tissue). Some cases included partial parotidectomy, or the removal of the superficial lobe while preserving facial nerve function. Most often, an S-shaped skin incision was performed before the auricle and the main trunk of the facial nerve was identified during the procedure [4, 5, 6].

Combined therapy is also used to treat malignant neoplasms, i.e. surgery (total parotidectomy with facial nerve resection) and postoperative radiotherapy. The Redon drain was inserted into the bed after excision of tumor and it was removed after ca. 24–48 hours. It was recommended to protect the postoperative wound, and use dressings (with octenisept) and a sparing lifestyle for about 2 weeks. After 7–10 days after surgery, sutures were removed.

Tab. III. Numerical ranking of patients depending on the location of tumors, histopathological diagnosis of tumor, body side and gender.

HISTOPATHOLOGICAL DIAGNOSIS	PAROTID GLAND				SUBMANDIBULAR GLAND				TOTAL	
	WOMEN		MEN		WOMEN		MEN		N	%
	P	L	P	L	P	L	P	L		
Multiform adenoma (mixed tumor)	5	6	5	6	2			1	25	26.3
Monomorphic adenoma (Warthin tumor)	11	10	13	12				2	48	50.5
Oncocytoma			2						2	2.2
Lymphoepithelial cyst			1	2					3	3.3
Myoepithelial adenoma	1			1					2	2.1
Lipofibroma		1							1	1.0
Congestive cyst		1		1					1	2.1
Air cyst (pneumocele)				1					1	1.0
Tubular adenoma		1							1	1.0
Basal cell adenoma		1							1	1.0
Cyst with squamous metaplasia features		1		1					2	2.2
Vascular malformation				1					1	1.0
Total	17	21	21	25	2			3	89	93.7

STUDY RESULTS

Patients with major salivary gland tumors were most often operated on (Tab. I.): aged 61–70, 14 women (14.7%) and 19 men (20.0%) respectively, and aged 51–60, 12 women (12.6%) and 10 men (10, 6%), while the least frequently operated patients were aged 20–30, 2 women (2.1%) and 2 men (2.1%), respectively.

The analysis of Tab. II. shows that the majority of tumors were operated on in the last 4 years, i.e. in 2016 in 19 patients (20.0%), in 2017 in 19 patients (20.0%), in 2018 in 17 patients (17.8%) and in 2019 in 19 patients (20.0%), which constituted 77.8% of all patients undergoing surgery. Among the operated lesions, benign tumors and neoplasms occurred in 89 patients (93.7%), of which most frequently histopathological examination revealed Warthin tumor in 48 cases (50.5%), including 21 women (22.1%) and 27 men (28.4%) and multiform adenoma (mixed tumor) in 25 cases (26.3%), including 13 women (13.7%) and 12 men (12.6%). Other neoplasms and benign tumors accounted for only 16.9% and were observed in individual cases, including: eosinophilic adenoma (oncocytoma), lymphoepithelial cyst, myoepithelial adenoma (myoepithelioma), fibrosarcoma (fibrolipoma), congestive cyst (mucocele), tubular adenoma, basal cell adenoma, cyst with squamous metaplasia features, vascular malformation, as illustrated in Tab. III.

The tumors were located mainly in the parotid glands, in as many as 89 cases (93.7%), of which the lesion location was as follows: superficial lobe 54 times (56.8%), deep lobe 19 cases (20.0%), at the border of the lobes 10 cases (10.5%), both lobes twice (2.1%), bilaterally in the parotid glands 4 cases (4.2%). Tumors of the submandibular gland occurred in 6 cases, including benign tumors 5 cases and malignancies in 1 case (6.3%).

Tumors occurred more frequently on the left side than on the right side, respectively in 49 cases (51.6%), including women in 21 cases (22.1%) and men in 28 cases (29.5%) and in 40 cases (42,1%), includ-

ing women in 19 cases (20.0%) and men in 21 cases (22.1%), as shown in Tab. III. Malignant neoplasms in the salivary glands were found in 6 cases (6.3%), including 5 cases in the parotid gland (5.3%) and in 1 case (1.1%) in the submandibular salivary gland (Tab. IV.). The following malignant tumors were diagnosed histopathologically: adenocarcinoma (T2N0M0), mucoepidermal carcinoma (T2N0M0), acinocellular carcinoma (T2N0M0), epithelial-myoepithelial carcinoma (pT3N0M0), ductal carcinoma (G2 pTx).

Among the surgical methods used, the most common was enucleation of the tumor (in 84 cases – 88.42%), while other methods were chosen less often, such as: excision of tumor with a margin of healthy tissue, total parotidectomy, total resection of the submandibular gland. In the case of a malignant tumor, cervical lymph nodes (reg I/II) were also excised. The procedure was performed under general endotracheal anesthesia. After the procedure, patients remained in the recovery room, where they were under the constant supervision of medical staff for 24 hours (parameters such as RR, HR, SatO2 are monitored). A Redon drainage tube was inserted at the operated site and was removed on the second day after surgery. Patients were hospitalized for approximately 4 days on average. The following postoperative complications were observed: facial paresis in 9 cases (9.5%), including 6 cases in the marginal mandibular branch (6.3%) and in 3 cases in the middle branch n. VII (3.2%), in 1 case total facial nerve palsy (1.1%), in 1 case a skin fistula resulting from abnormal wound healing (1.1%) and in another case postoperative hematoma (1.1%). Patients with facial paresis were administered: galantamine injections (2.5–5 mg) for 14 days, vitamins B12, B6, B1 (Milgamma N) 2 ml for 5 days, physiotherapeutic rehabilitation was also used.

DISCUSSION OF RESULTS

In the analyzed material surgery was more frequently performed on patients affected by major salivary gland tumors aged 61–70, 14

Tab. IV. Numerical summary of patients with malignant tumors of the salivary glands depending on location, histopathological diagnosis, body side and gender.

HISTOPATHOLOGICAL DIAGNOSIS	PAROTID GLAND				SUBMANDIBULAR GLAND				TOTAL	
	WOMEN		MEN		WOMEN		MEN		N	%
	R	L	R	L	R	L	R	L		
Adenoid cystic carcinoma						1			1	1.05
Mucoepidermoid carcinoma	1	1							2	2.1
Acinocellular carcinoma		1							1	1.05
Epithelial-myoepithelial carcinoma				1					1	1.05
Ductal carcinoma		1							1	1.5
Total	1	3		1		1			6	6.3

women (14.7%) and 19 men (20.0%) respectively, and 51–60 years old, 12 women (12.6% respectively) and 10 men (10.6%).

In the presented material, most patients suffered from benign lesions, while six patients (6.3%) had malignant tumors of the salivary glands. Similar results as to the incidence of the aforementioned salivary gland cancers are presented by other researchers [4]. The most common among benign tumors was Warthin's tumor in 348 cases (50.5%) and multiform adenoma in 25 cases (26.3%), which also correlates with reports from other authors. In contrast to the data of other clinics, Warthin's tumor (cystic lymphangioma) was more common than mixed tumor [7, 8, 9, 10]. Recurrence of cystic lymphangioma was found in 6 patients. Multiple lesions in the form of two Warthin tumors in the left parotid gland were observed in 3 patients (3.2%). Synchronous occurrence of tumors in the parotid glands was observed in 2 cases (2.1%). Metachronous incidence of Warthin tumor was also found also in 2 patients (2.1%) [5, 7, 10].

One patient was diagnosed with a Warthin tumor of the left parotid gland and was operated; 3 months later the patient noticed a change in the right parotid gland, and a year later tumor recurrence was found in the left parotid gland. Another patient was affected by a simultaneous occurrence of a Warthin tumor in the left parotid gland and Hodgkin lymphoma on the left side. One of the patients had mycobacterium tuberculosis infection within Warthin's tumor [11, 12].

In the case of mixed tumor, in 2 patients (2.1%) recurrence was observed after 27 years and after 18 years. Another patient was found with bilateral, synchronous occurrence of mixed tumor in the parotid glands. Mixed tumor was mainly found in the parotid glands (22 times) and in the submandibular glands (3 times). The probability of transformation of multiform adenoma into one form of cancer is about 2% [13], of which one such case occurred in our material (1.1%). Tumors were more frequent on the left side than on the right side, respectively in 49 cases (51.6%) and in 40 cases (42.1%), similarly to the available literature [9].

In the case of malignant tumors – one of the patients was operated on three times: mixed tumor of the left submandibular gland (2008), adenoid cystic carcinoma of the left submandibular gland (2013), acinocellular carcinoma of the left parotid gland (2017). Another patient was affected by left parotid gland adenoma and non-small cell anaplastic carcinoma of right parotid gland. Pa-

tients with malignant neoplasms were presented at the Oncological Concilium, and adjuvant radiotherapy was recommended in 3 cases. The most commonly used surgical technique was tumor enucleation (in 84 cases – 88.4%), while other methods were used less frequently. Early postoperative complications included seventh nerve palsy (most often marginal mandibular branch), fistula formation and hematoma [7, 14, 15, 16]. The location of the changes determines the use of the appropriate operational technique. Partial parotidectomy involving the excision of a tumor with an unchanged tumor-free resection margin was performed when the tumor invaded the superficial lobe (lateral part from the facial nerve plane or lower pole of parotid gland).

The Laryngological Oncology, Audiology and Phoniatics Clinic USK at the Military Medical Academy in Łódź is one of the centers for treatment of salivary gland cancers in the Łódź voivodeship [17]. Over the past 7 years, 95 salivary gland cancers have been diagnosed and operated there, whereby these cases were dominated by benign tumors (Warthin tumor, mixed tumor) of the parotid gland, which coincides with the National Cancer Registry data and literature data [18]. Most tumors were hospitalized in the last 4 years between 2016–2019, which accounted for 77.8% of all operated patients.

CONCLUSIONS

1. In the analyzed material patients with major salivary gland tumors were most frequently operated on at the age of 61–70 (34.7%) and 51–60 years (23.2%);
2. Most operated salivary gland tumors were benign (93.7%), of which the most common histopathologically were: Warthin tumor (50.5%) and multiform adenoma (26.3%), while malignant tumors occurred in 6.3%;
3. Tumors were localized mainly in the parotid gland in as many as 93.7% cases, of which the most common localization concerned the superficial lobe in 56.8%;
4. The most frequent surgical technique used in the Clinic was extracapsular dissection of the tumor in 88.4%, other methods were used rarely.

REFERENCES

1. Krajowy rejestr nowotworów: <http://onkologia.org.pl/rak-duzych-gruczolow-slinowych/>.
2. Pilch B.Z., Gillies E., Houck J.R., Min K.W., Novis D. et al.: Upper Aerodigestive Tract (Including Salivary Glands). Protocol applies to all invasive carcinomas of the upper aerodigestive tract including the oral cavity (including lip and tongue), pharynx (oropharynx, hypopharynx, nasopharynx), larynx, paranasal sinuses, and salivary glands Protocol revision date: January 2004, Based on AJCC/UICC TNM, 6th edition.
3. Szwedowicz P., Osuch-Wójcikiewicz E.: Diagnostyka guzów ślinianki przyusznej. *Pol Przegl Otolaryngol*, 2012; 1(1): 40–46.
4. Golusiński W.: Chirurgia i onkologia głowy i szyi. Tom I. Edra Urban & Partner, Wrocław 2015.
5. Szyfter W.: Nowotwory w otolaryngologii. Wyd. II. Termedia, Poznań 2015.
6. Theissing J., Rettinger G., Werner J.A., Hoppe F., Rudack C.: Otolaryngologia chirurgia głowy i szyi. Med-Media, Dublin 2014.
7. Chulam T.C., Francioso Noronha A.L., Goncalves Filho J., Alves Pinto C.A., Kowalski L.P.: Warthin's tumour of the parotid gland: our experience *Acta Otorhinolaryngol Ital*, 2013; 33(6): 393–397.
8. Olejniczak I., Kozłowski Z., Dąbrowska K., Łukowski M.: Tumors of the parotid gland – management and results of surgical treatment. *Otolaryngol Pol*, 2006; 60(3): 313–316.
9. Suwała P., Wilczyński K., Barnaś Sz., Pitala G.: Salivary tumors in the material of the Otolaryngology Clinical Ward of 4th Military Clinical Hospital with the Polyclinic in Wrocław in the years 1992–2008. *Otolaryngol Pol*, 2009; 63(7): 54–57.
10. Pietniczka-Załęska M., Dąbrowska-Bień J.: Parotid tumors: experience of Otolaryngology Department at MSS Hospital in Warsaw. *Otolaryngol Pol*, 2008; 42(4): 395–399.
11. Pasternak K., Markowski J., Paluch J., Kajor M.: Origin of tuberculosis within Warthin's tumor of parotid gland. *Pol Przegl Laryngol*, 2012; 3(1): 252–254.
12. Ułusan M., Abul Y., Bakır S.: Mycobacterium Tuberculosis Infection within a Warthin Tumor: A Case report and literature review. *N Am J Med Sci*, 2013; 5(10): 617–619.
13. Pietniczka-Załęska M., Kukwa A.: The parotid gland's tumours in material of Otolaryngology Department Medical Academy in Warsaw in 1990–2006. *Otolaryngol Pol*, 1999; 53(supl 30): 247–249.
14. Marchese-Ragona R., De Filippis C., Marioni G., Staffieri A.: Treatment of complications of parotid gland surgery *Acta Otorhinolaryngol Ital*, 2005; 25(3): 174–178.
15. Wierzoń J., Szymczyk C., Maciejewski A., Półtorak S.: Partial parotidectomy – alternative method in surgical management of parotid gland Warthin tumours. *Otolaryngol Pol*, 2007; 61(2): 142–146.
16. Osuch-Wójcikiewicz E., Chęciński P.: Parotidectomy – How I do It. *Pol Przegl Laryngol*, 2013; 2(2): 93–98.
17. Morawiec-Sztandera A.: Laryngologia onkologiczna – diagnostyka, leczenie, rehabilitacja. PZWL, Warszawa 2017.
18. Jain S., Hasan S., Vyas N., Shah N., Dalal S.: Pleomorphic adenoma of the parotid gland: Report of a case with review of literature *Ethiop J Health Sci*, 2015; 25(2): 189–184.

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